

AMENDMENT IN THE CLAIMS

1. (Currently Amended) An actuator comprising:
a core member, having a central projection;
a coil wrapped around said central projection;
a magnet positioned so as to provide a gap between said core member and said magnet
and operable to move in a degree of freedom relative to said core member; and
an elastic material disposed in said gap and configured to limit a range of motion of said magnet in said degree of freedom.

2. (Previously Presented) An actuator as recited in claim 1 wherein said elastic material comprises foam.

3. (Previously Presented) An actuator as recited in claim 1 further comprising a controller electrically connected to said coil for generating a drive signal.

4. (Previously Presented) An actuator as recited in claim 1 further comprising a first flexible member attached to said magnet and said core member.

5. (Previously Presented) An actuator as recited in claim 1, further comprising:
a ground member attached to said core member; and
a first flexible member attached to said magnet and said ground member.

6. (Previously Presented) An actuator as recited in claim 1, further comprising a first flexible member attached to said magnet and to a grounded surface.

7. (Previously Presented) An actuator as recited in claim 6, wherein said grounded surface comprises an actuator housing.

8. (Previously Presented) An actuator as recited in claim 1 wherein said magnet is configured to move linearly.

9. (Previously Presented) An actuator as recited in claim 1 wherein said magnet is configured to move rotationally.

10. (Previously Presented) An actuator as recited in claim 1, wherein:

said core member comprises a first curved surface;

said magnet comprises a second curved surface; and

said elastic material is disposed in a gap formed between said first curved surface and said second curved surface.

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11. (Currently Amended) An actuator comprising:

a core member having a central projection;

a coil wrapped around said central projection;

a magnet positioned so as to provide a gap between said core member and said magnet;

and

a first flexible member attached to said core member and said magnet and configured to limit a range of motion of said magnet.

12. (Previously Presented) An actuator as recited in claim 11 further comprising an elastic material disposed in said gap.

13. (Previously Presented) An actuator as recited in claim 11 wherein said first flexible member is attached to said magnet and a grounded surface.

14. (Cancelled)

15. (Previously Presented) An actuator as recited in claim 13 wherein said grounded surface comprises an actuator housing.

16. (Previously Presented) An actuator as recited in claim 11 wherein said magnet is configured to move linearly.

17. (Previously Presented) An actuator as recited in claim 11 wherein said magnet is configured to move rotationally.

Claims 18 - 23. (Cancelled)

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24. (Previously Added) An actuator as recited in claim 4 wherein said first flexible member is attached to said magnet head and a ground surface.

25. (Previously Added) An actuator as recited in claim 5, further comprising a second flexible member attached to said magnet and said ground member.

26. (Previously Added) An actuator as recited in claim 12, wherein said elastic material comprises foam.

27. (Previously Added) An actuator as recited in claim 13, further comprising a controller electrically connected to said coil for generating a drive signal.

28. (Previously Added) An actuator as recited in claim 13, further comprising a second flexible member attached to said magnet and said core member.

29. (Previously Added) An actuator as recited in claim 13, wherein:
said core member comprises a first curved surface;

said magnet comprises a second curved surface.

30. (Previously Added) An actuator as recited in claim 29, further comprising an elastic material positioned in a gap formed between said first curved surface and said second curved surface.

31. (Currently Amended) An actuator comprising:

a core member, having a central projection;

a coil wrapped around said central projection;

a magnet positioned so as to provide a gap between said core member and said magnet;

and

a ground member attached to said core member; and

a first flexible member attached to said magnet and said ground member and configured to limit a range of motion of said magnet.

32. (Previously Added) An actuator as recited in claim 31, further comprising a second flexible member attached to said magnet and said ground member.

33. (Previously Added) An actuator as recited in claim 31, wherein said ground member comprises a grounded surface.

34. (Previously Added) An actuator as recited in claim 34, wherein said grounded surface comprises a surface of a housing.

35. (Previously Added) A device comprising:

a manipulandum having a housing; and

an actuator as recited in claim 1 coupled to said manipulandum and disposed within said housing.

36. (Previously Added) A device as recited in claim 35, wherein said manipulandum comprises a joystick.

37. (Previously Added) A device comprising:

a manipulandum having a housing; and

an actuator as recited in claim 11 coupled to said manipulandum and disposed within said housing.

38. (Previously Added) A device as recited in claim 37, wherein said manipulandum comprises a joystick.

39. (Previously Added) An actuator as recited in claim 1 wherein the elastic material is configured to restrict a range of motion of the magnet or the core member.
